5.2 Increases in Noise Floor - Single Lamp

The noise floor in the Boxborough Area (25 miles outside Boston) was observed to be about 4 dBμV/m, or 1.6 μV/m. The sensitivity of standard receivers range from 5 μV to 15 μV (or 14 dBμV to 24 dBμV/m). Assuming an ideal antenna on the receiver with no losses, the signal from the licensed transmitter would be about 10 dB above the noise floor before the modulation (voice or data) could be received.

An increase of the noise floor of greater than 10 dB would place the interferer at the threshold of the receiver, possibly causing interference when the received signal approaches the threshold.

A calculation was performed in order to determine what level would be required to increase the noise floor approximately 5 dB. With a noise floor of 4 dBμV/m, a field strength must be introduced with a magnitude of 9 dBμV/m. The level of the interfering signal would be 2.818 μV/m. Please note that this level remains significantly below the receiver sensitivity.

The radiated emission levels from the EFL were observed to be 70 dBμV/m at a measurement distance of 3 meters. An estimated drop-off factor of 53 dB is used in order to extrapolate the radiated field strength to a further distance. This number was determined through several measurements, particularly those measurements from the November/December samples (Proto 3, Samples 1, 2 & 3).

In order for the EFL to increase the Boxborough noise floor from 4 dBμV/m to 9 dBμV/m, the field strength from the EFL at the receiver would be 9 dBμV/m, or higher. The distance from one EFL to the receiver that causes a 5 dB increase was determined to be 11.3 meters.

Note: For this measurement, we used a 106 dB/decade drop-off factor. This drop-off was taken from original testing where the signal was determined to be reduced 53 dB when the measurement antenna was brought from a 3 meter distance from the product to a 10 meter distance. This drop-off was much higher than 20 dB/decade for the following reasons: 1) At the frequency of concern, all measurements are in the near-field; and 2) The radiating element is effective in the near-field, but lesser effective at greater distances.

The distance to reduce the signal (recorded at a 3 meter distance) to a level of 9 dBμV/m (which is 5 dB above the limit) can be determined in the following equation:

1. $E_{D1} - 9\ dB\mu V/m = 106\ LOG_{10}\ [d1 / d2]$

   where: E_{D1} = *Field Strength measured at a 3 meter distance*

   $d2$ = *3 meter*

   $d1$ = *distance required*

2. $LOG_{10}\ [d1 / d2] = [(E_{D1} - 9\ dB\mu V/m) / 106]$

3. $d1 / d2 = 10^{[(ED1 - 9\ dB\mu V/m) / 106]}$

4. $d1 = d2 * 10^{[(ED1 - 9\ dB\mu V/m) / 106]}$

For a signal level (E_{D1}) of 70 dBμV/m (level from one lamp, worst-case) at a distance of 3 meters (d2), the distance would be as follows:

$$d1 = 3 * 10^{[(70 - 9\ dB\mu V/m) / 106]}$$

$$d1 = 11.3 \text{ meters.}$$

In the Boxborough area, the noise floor is approximately 10 dB below average equipment sensitivity. In order to increase the noise floor 10 dB to the receiver threshold, the new level of the interferer is 14 dBμV/m. At a distance of 10.1 meters from the EFL, a field strength of 14 dBμV/m is present.

5.3 Increases in Noise Floor - Two Lamps

Our measurements of three samples showed that the power of each individual lamp did not combine due to their operating frequencies. For the following calculations, we assumed that the operating frequencies of the lamps are within 1 kHz of each other.

If two lamps are present, the combined field strength level is expected to double, or increase by a factor of 2; 6 dB. The effects of the two lamps causing a 5 dB increase in the noise floor can be observed when the lamps are placed at a distance of 12.9 meters. The calculation would be as follows:

For a signal level (E_{D1}) of 70 dBμV/m (level from one lamp, worst-case) at a distance of 3 meters (d2), the distance would be as follows:

$$d1 = 3 * 10^{[(76 - 9\ dB\mu V/m) / 106]}$$

$$d1 = 12.9 \text{ meters.}$$

Where 76 dBμV/m is the field strength at a distance of 3 meters of two lamps assumed to operate at the exact same frequency, 9 dBμV/m is the noise floor (assuming a 5 dB increase).

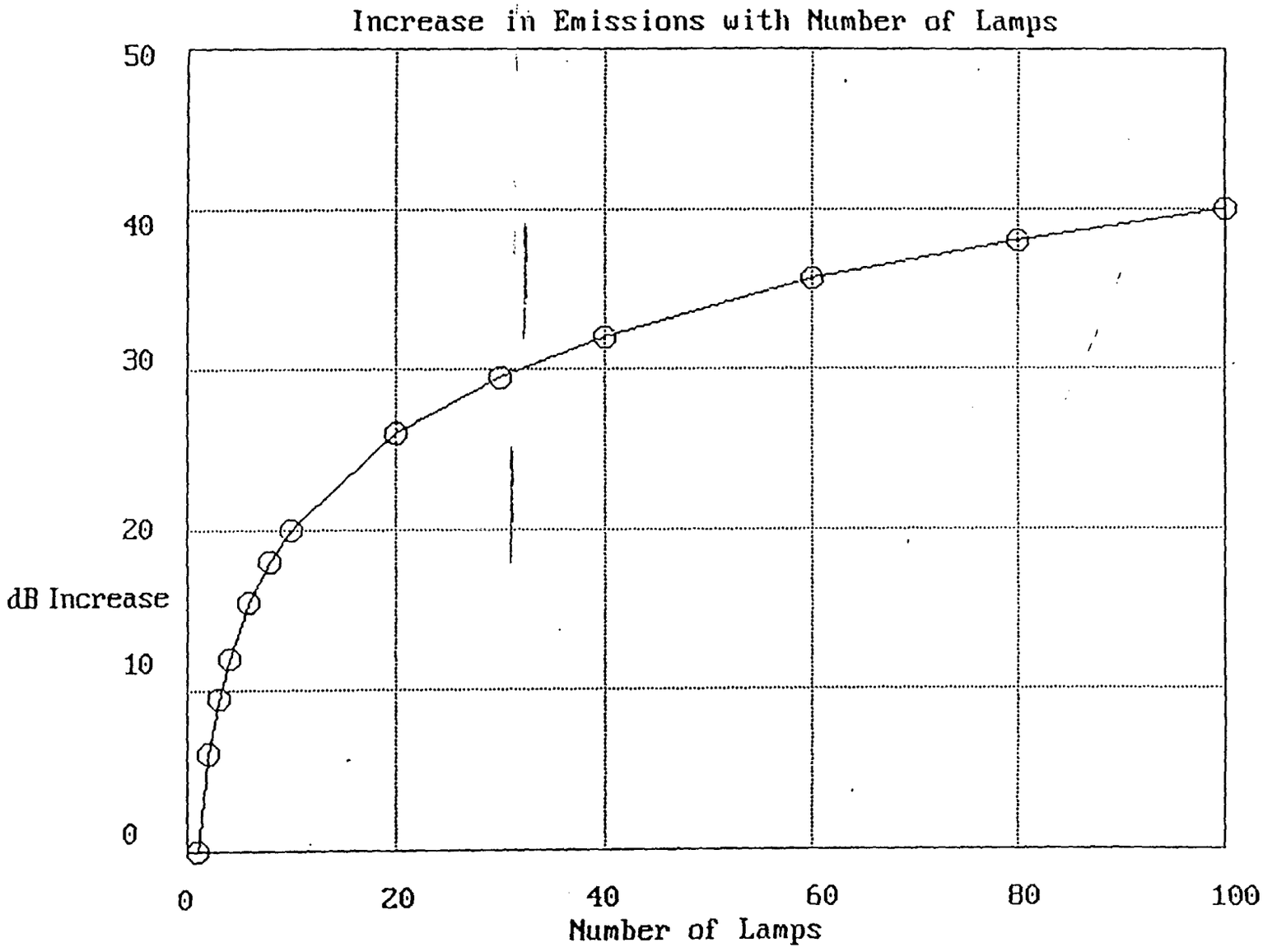
The same two lamps would increase the noise floor 10 dB if operated within 11.5 meters of the receiving equipment. Please note that the receiving equipment as used for these calculations are considered a single point, only measuring the field strength at that specific point.

5.4 Increases in Noise Floor - Multiple Lamps

Assuming all lamps operate at the same frequency, and their powers are added when combined, the emission levels would be increased as shown in the table below and on the following graph (this is an absolute worst-case scenario):

Number of Lamps	Decibel Increase	Distance to increase noise floor 5 dB (meters)
1	n/a	11.3
2	6	12.8
3	9.5	13.9
4	12	14.7
6	15.5	15.8
8	18	16.7
10	20	17.4
20	26	19.8
30	29.5	21.4
40	32	22.6
60	35.6	24.4
80	38	25.8
100	40	26.9

If 100 lamps are operated at the same frequency, at the same time, at the same location, the total radiated field could be estimated at 130 dBμV/m (70 dBμV/m from one lamp + 40 dB) at a distance of 3 meters from the lamps (absolute worst-case). For these lamps to cause a 5 dB increase in the noise floor, the 100 lamps must be within 26.9 meters from the receiver (a point). For a 10 dB increase, the lamps should be placed 24.1 meters from the receiver.


Increase in Emissions with Number of Lamps
50
40
30
20
10
0
dB Increase
0
20
40
60
80
100
Number of Lamps

5.5 Interference caused by new limits

The worst case line-conducted emission level was observed to be 63 dBμV. Increasing the emission limits from 48 dBμV to 70 dBμV and 92 dBμV would not increase the levels emanated from the Electrodeless Compact Fluorescent Lamp (However, slight changes to the product and production variations could cause slight degradations in the emission levels). If the limit were increased to 70 dBμV and 92 dBμV, and it is assumed that the emissions from the product will increase to marginal levels, the impact is discussed below. Please note that the intent of this application for waiver is not to relax the limit to allow lesser-quality designs to meet the emission requirements, but rather to allow this specific design and future quality designs to be marketable.

First, it is assumed that the lower the AC mains line-conducted emissions, the lower the radiated emissions, since the radiating element is a combination of lamp and AC wiring. Increasing the line-conducted limit will allow for an increase in the energy radiated from the product at the operating frequency. With respect to radiated energy, this particular frequency is unregulated by Part 18 as it is below 30 MHz.

At the present time, the line-conducted emission limit from Proto 3, Sample 2 (worst-case) is 63 dBμV. If the AC mains line-conducted emission at 2.49 MHz was reduced to a level 48 dBμV, which is the current limit, it is assumed that the field strength (now 70 dBμV/m from Proto 3, Samples 1 and 3) would also be reduced to a level 15 dB lower, or 55 dBμV/m. If all lamps emitted a signal level of 55 dBμV/m, one lamp would cause the noise floor in the Boxborough Massachusetts area to increase 5 dB when the lamp was brought within 8.2 meters of the receiving antenna (a point).

If the AC mains, line-conducted emission limit was increased from 48 dBμV to 70 dBμV, and the line-conducted emission from the EFL was allowed to increase to the limit (an increase of 7 dB), then the radiated emission level would increase 7 dB and become 77 dBμV/m.
In this condition, the lamp would cause an increase of 5 dB in the noise floor when brought within 13.1 meters of the receiver.

Increasing the level of the AC mains line-conducted emission to 92 dBμV would cause a 29 dB increase in radiated emission level, resulting in a 5 dB increase in the noise floor whenever the lamp was brought within 21.2 meters of the receiver. If this condition were possible, 100 lamps would cause a 5 dB increase in the noise floor at a distance of 50.5 meters.

5.6 Discussion of Possible Interference

Exhibits 5.1 through 5.6 discuss the possibility of interference when the noise floor at the receiver is increased from 5 dB to 10 dB. In the Boxborough, Massachusetts and Belmont California areas, an increase of 10 dB would place the signal emitted from the lamp at the threshold of the receiver, possibly causing interference when the received signal approaches the threshold.

Several scenarios were used to demonstrate what it would take to cause an increase in the noise floor. However, all documentation included does not discuss crucial items such as the type of receiving antenna attached to the base station, the location of the antennas to the facilities, the height of the antennas above the earth, and the shielding properties of the facilities where lamps are installed.

Interference to mobile transceivers, whether installed on ships, motor vehicles, or handheld, is not a concern from these Electrodeless Compact Fluorescent Lamps. These lamps are designed for usage in commercial and residential facilities (indoors). At the base station, antennas designed to transmit and receive MF/HF frequencies are very long rod antennas. These antennas are vertically polarized in order to maximize the ground wave (waves that stay close to the earth and do not reach the receiving point by reflection or refraction from the ionosphere). The length of these antennas is generally 1/2 wavelength or 1/4 wavelength (60 meters or 30 meters, respectively). It is recommended that these antennas are located one wavelength (120 meters) from reflective structures, such as office buildings.

No conclusive data could be provided regarding the shielding effectiveness ~~of a facility~~, as each facility would have different properties, mostly dependant on construction materials.

A calculation showed that 100 lamps, operated at the same frequency, could cause a 5 dB increase in the noise floor when they were within 27 meters of the receiving antenna. With the recommended guideline of 1 wavelength (120 meters) separation between base facility and antenna, it is very likely that the antennas will not be within 27 meters of the facility.

6.0 Summary

The receiver designs are very sophisticated and generally prevent the ambient energy on the AC supply from causing harmful interference to the receiver. Radiated energy, on the other hand, cannot be so easily controlled. Radiated energy at the reception frequency at the antenna can not be filtered or suppressed.

The Electrodeless Compact Fluorescent Lamp is intended to be installed in domestic and commercial environments without restrictions to locations within the continental United States. It may be feasible to install several of these lamps in the same vicinity as the towers used to receive the Licensed Broadcast signals in accordance with Part 90. Several calculations based on measurements were supplied to show at what distance the noise floor at the receiving antenna would be increased by 5 dB and 10 dB. These calculations showed that the lamps would have to be within 11.3 meters for a single lamp, 17.4 meters for ten lamps, and 26.9 meters for up to 100 lamps. For a 10 dB increase in the noise floor (placing the interferer at the threshold of the average receiver), the 100 lamps could be brought within 24.1 meters of the receiver.

Measurements have been provided which demonstrate the emission levels of two sets of samples, prototype designed Electrodeless Compact Fluorescent Lamps. Proto 3 samples were shown to be worst-case, causing failures to the existing Part 18 consumer limits of 16 dB, radiated emissions from 30 MHz to 1000 MHz, and 15 dB AC mains line-conducted emissions from 450 kHz to 30.0 MHz. The interference potential of the Proto 4 sample was significantly less than the Proto 3 samples. The highest worst-case radiated emission exceeded the FCC Part 18 limit by 4 dB, and the worst-case line-conducted emission exceeded the FCC limit by 11 dB.

Usage of this product is unlikely to cause interference unless it is used within 10 - 20 meters of the receiving station. There are many additional factors which must be considered about the likelihood of this device causing interference including: 1) the shielding effectiveness of the facility these are to be used inside; 2) the separation from the base antenna to the facility, or nearby facility; and 3) the protection provided in most receivers to limit energy on the AC mains to prevent corruption of the receiver.

Please feel free to contact me if you have any questions or comments. I can be reached at (508) 263-2662 or by FAX at (508) 263-7086.

Sincerely,

Joseph B. Woodworth
EMI Section Manager

DASH, STRAUS & GOODHUE, INC. - TERMS and CONDITIONS

Article 1 - Services, LABORATORY will:

1.1 Act for CLIENT in a professional manner, using the degree of care and skill ordinarily exercised by and consistent with the standards of the profession.

1.2 Provide only those services that lie within the technical and professional areas of expertise of LABORATORY and which LABORATORY is adequately staffed and equipped to perform.

1.3 Perform all technical services in substantial accordance with the generally accepted laboratory testing principles and practices.

1.4 Promptly submit formal reports of technical services performed indicating, where applicable, compliance with specification or other contract documents. Such reports shall be complete and factual, citing where appropriate the technical services performed, methods employed, and values obtained.

1.5 Employ instrumentation which has been calibrated within a period not exceeding twelve (12) months from the time of use by devices of accuracy traceable to the National Institute of Standards and Technology of the United States Department of Commerce.

1.6 Consider all reports to be the confidential property of client, and distribute reports only to those persons, organizations or agencies designated by CLIENT or his authorized representative.

1.7 Retain all pertinent records relating to the services performed for a period of three (3) years following submission of the report or the suspension of manufacturing of product subject to follow-up services, whichever is later, during which period the records will be made available to CLIENT upon reasonable request.

Article 2 - Client's Responsibilities, CLIENT or his authorized representative will:

2.1 Provide LABORATORY with all plans, schematics, specifications, addenda, change orders, drawings and other information for the proper performance of technical services.

2.2 Designate a person to act as CLIENT's representative with respect to LABORATORY's services to be performed under this Agreement; such person or firm to have complete authority to transmit instructions, receive information and data, interpret and define CLIENT's policies and decisions with respect to the project and to order, at CLIENT's expense, such technical services as may be required.

2.3 Designate a person who is authorized to receive copies of LABORATORY's test reports.

2.4 To undertake the following:

(a) Secure and deliver to LABORATORY, without cost to LABORATORY, preliminary representative samples of that equipment proposed to require technical analysis, together with any relevant data.

(b) Furnish such labor and equipment needed by LABORATORY to handle samples at the LABORATORY and to facilitate the specified technical analysis.

Article 3 - General Conditions

3.1 LABORATORY, by the performance of services covered hereunder, does not in any way assume any of those duties or responsibilities customarily vested in the CLIENT's employees, or any other party, agency or authority.

3.2 LABORATORY shall not be responsible for acts or omissions of any other party or parties involved in the design, manufacture or maintenance of the equipment or the failure of any employee, contractor or subcontractor to undertake any aspect of equipment's design, manufacture or maintenance.

3.3 LABORATORY is not authorized to revoke, alter, relax, enlarge or release any requirement of the equipment's design, manufacture or maintenance unless specifically authorized by CLIENT or his authorized representative.

3.4 *This Agreement may be terminated by either party on ten (10) days* written notice or by mutual agreement. If this Agreement is terminated by either party, LABORATORY shall be paid in full for all services performed through the termination date, and the CLIENT shall be provided with a complete report of the results of technical analysis conducted prior to termination.

3.5 Neither CLIENT nor LABORATORY may delegate, assign, sublet or transfer his duties or interest in this Agreement without the written consent of the other party.

3.6 ***The only warranty made by LABORATORY in connection with its service performed hereunder is that it will use that degree of care and skill as set forth in Article 1.1 and 1.3 above. No other warranty, expressed or implied, is made or intended for services provided hereunder.***

3.7 Where the LABORATORY indicates that additional testing is advisable to obtain more valid or useful data, and where such testing has not been authorized in writing, CLIENT agrees to view such test reports as inconclusive and preliminary.

3.8 The LABORATORY shall supply technical service and prepare a report based solely on the sample submitted to the LABORATORY by the CLIENT. The CLIENT understands that application of the data to other devices is highly speculative and should be applied with extreme caution.

3.9 The LABORATORY agrees to exercise ordinary care in receiving, preserving and shipping (F.O.B. Boxborough, Mass.) any sample to be tested, but assumes no responsibility for damages, either direct or consequential, which arise or are alleged to arise from loss, damage or destruction of the samples due to the act of examination, modification or testing, or technical analysis, or circumstances beyond LABORATORY's control.

3.10 The LABORATORY will hold samples for thirty (30) days after tests are completed, or until the CLIENT's outstanding debts to the LABORATORY are satisfied, whichever is later.

3.11 The client recognizes that samples of products subject to LABORATORY's review and test procedures may be damaged or destroyed.

3.12 The CLIENT recognizes that generally accepted error variances apply and agrees to consider such error variances in its use of test data.

3.13 It is agreed between LABORATORY and CLIENT that no distribution of any test, reports or analysis shall be made to any third party without the prior written consent of both parties. The content of all reports, analysis and tests is strictly confidential and shall not be released to any third party without the written consent of the other party.

3.14 The CLIENT acknowledges that all employees of LABORATORY operate under employment contracts with the LABORATORY, and CLIENT agrees not to solicit employment of such employees, or solicit information related to other clients from said employees.

Article 4 - Follow-Up Services (for listed products only)

4.1 If the product is found to be in compliance with the review and test requirements, it is agreed that CLIENT will abide by the Follow-Up Service Procedure.

4.2 It is understood and agreed by the CLIENT that the LABORATORY name or listing mark will not be applied or utilized until authorized representatives of LABORATORY have concluded the procedure set forth in Article 4.1.

4.3 All costs associated with the Follow-Up Service Procedure will be the responsibility of CLIENT. CLIENT's failure to pay these charges will result in the revocation of authorization to use the LABORATORY listing mark.

Article 5 - Insurance

5.1 LABORATORY shall secure and maintain throughout the full period of this Agreement sufficient insurance to protect it adequately from claims under applicable Workmen's Compensation Acts and from claims for bodily injury, death or property damage as may arise from the performance of services under this Agreement.

5.2 The CLIENT hereby warrants that it has sufficient insurance to protect its employees adequately under applicable Workmen's Compensation Acts and for bodily injury, death or property damage as may arise from the acts of its employees pursuant to the Agreement.

5.3 No insurance, of whatever kind or type, which may be carried by LABORATORY is to be considered as in any way limiting any other party's responsibility for damages resulting from their operations or for furnishing work and materials related to the project.

Article 6 - Payment

6.1 CLIENT will pay LABORATORY for services and expenses. LABORATORY's invoices will be presented at the completion of its work or monthly and will be paid within thirty (30) days of receipt by CLIENT or his authorized representative.

6.2 LABORATORY shall be paid in full as described in Article 6.1 and, in addition, shall be paid in full for any services authorized orally or in writing by an employee or agent of the CLIENT pursuant to Article 2.2.

Article 7 - Extent of Agreement

The Agreement, including these Terms and Conditions and the Schedules attached hereto, represent the entire agreement between CLIENT and LABORATORY and supersedes all prior negotiations, representations or agreements, written or oral. The Agreement may be amended only in accordance with this Agreement or by written instrument signed by CLIENT and LABORATORY.

Article 8 - Collection

8.1 CLIENT shall pay LABORATORY interest in the amount of one and one half percent (1.5%) per month on amounts invoiced which are overdue. Invoices which are overdue are defined as those which remain unpaid more than thirty (30) days after presentation.

8.2 CLIENT agrees to pay LABORATORY all amounts incurred by LABORATORY in collecting on invoices which are overdue. Such amounts shall include, but shall not be limited to, reasonable attorneys' fees and court costs.

Exhibit 13

Exhibit 13

EXHIBIT 13

DS&G INTERFERENCE STUDY SUMMARY

Introduction

General Electric Company enlisted the services of an independent EMI testing Laboratory, Dash Strauss & Goodhue (DS&G), a division of Inchcape Testing, to study the interference potential of the 2.6 MHz. Electrodeless Fluorescent Lamp (EFL). This preliminary study evaluated 4 prototype electrodeless lamps, designated Proto 3 (Samples 1, 2 & 3) and Proto 4. The scope of this study was to address the following:

- Evaluations of the prototypes to the current FCC Part 18 regulations
- ELF/VLF radiated emissions
- Safety of the E & H field emissions per ANSI/IEEE C95.1-1991
- Services allocated in the 2.2-3.0 MHz bands
- Changes in the use of the 2.2-3.0 MHz
- Descriptions and number of users in the 2.2-3.0 MHz bands
- Increases in the noise floor from multiple electrodeless lamps
- Potential interference caused by raising conducted voltage limits to 70 dBμV and 92 dBμV

FCC Evaluations

All of the Proto 3 & 4 samples studied did not meet the current consumer FCC Part 18 limits for conducted and radiated emissions. Although, Proto 4 demonstrated a significant improvement in the radiated and conducted EMI.

EFL Radiated Safety

Proto 3 & 4 passed the ANSI/IEEE C95.1-1991 maximum permissible exposure for emitting devices in uncontrolled environments by a large margin of 75 dB, (5623 times lower), at distances of 0.5 m. (1) Based on the ANSI/IEEE C95.1-1991, EFL samples Proto 3 & 4 pose no radiation risk to individuals located in the same environments as the lamps.

Radio Services

The services operating in the 2.2-3.0 MHz band can be categorized in four groups. They are:

- International Fixed Public Radio Communications Services
- Maritime Services
- Aviation Services
- Private Land Mobile Radio Services

The International Fixed Public Radio Communication Services were used for radiotelephone and radiotelegraph services and are not currently in use. International communications are using other bands that have been allocated for this service. No party has the authority to use this service without a license. (2) The Maritime Services support ship-to-shore communication in the 2.2-3.0 MHz band. The service also supports the Distress and Aviation Stations. None of these services are used for over-land communications. Some new distress services are being developed although no licenses have been issued. (3)

Aviation services have some active use on the 2.2-3.0 MHz bands. They are used by the Civil Air Patrol and overseas aviation communications. The movement in these services is toward satellite communications above 1.5 GHz. (5)

Private Land Mobile Radio Service currently uses numerous frequencies in the 2.2-3.0 MHz band. Seven services currently exist and 2000 licenses are issued. All of these services rely on a fixed tower or antenna for base communication. Transmitters are generally in the kilowatts of radiated power. (3)

Noise Floor Measurements

The average Noise Floor for two sample sites, densely populated Boston, Massachusetts and rural Belmont, California were measured to be 2μV. Typical

receivers used in the 2.2-3.0 MHz band have a sensitivity of 5 to 15μV. This is approximately 8 dB above the average Noise Floor.

Theoretical Predictions for Determining the Increase in the Noise Floor from Multiple EFL Lamps

Interference potential to a receiver due to noise sources can be estimated by measuring the radiation properties of the two devices at two or more locations. The radiation of these two sources is then compared to known theoretical propagation principles. A conservative way of implementing this prediction is to configure the test in a worst case scenario. This philosophy was used in DS&G EFL Interference Study. The risk of error in this prediction is the unnecessary added cost to the product for added EMI containment. An additional low risk of interference may be the interaction of the EFL lamp with a device not specifically tested. Real life experience with RF lighting products operating in the 2.2-3.0 MHz bands in large consumer installations is nonexistent. As a result the following assumptions were made for the theoretical prediction.

- All of the lamps are operating at exactly the same frequency
- All the lamps are on at the same time
- All of the lamps are in the same location
- The EMI radiation would be additive

These assumptions are not totally realistic since the application of the lighting products in residential installations would be considerably different.

Summary of the Theoretical Predictions for 100 EFL Lamps

the following assumes a 5 dB increase in the Noise Floor but would be at least 5 dB below the typical receiver sensitivity. Lamps are assumed to be radiating at the referenced limit.

FCC Part 18 Limit	Distance for 5 dB Margin
48 dBμV	9.4 m
70 dBμV	13.6 m
92 dBμV	17.7 m

It then can be concluded from this worse case prediction that the EFL lamps radiating at the 70 dBμV limit would need to be at a distance of 4.2 m farther from the receiver to have the same interference potential as EFL lamps radiating at the current limit FCC Part 18 limit of 48 dBμV. Additionally, EFL lamps operating at the 92 dBμV limit would need to be 8.3 m farther to have the same interference potential as the current FCC limit of 48dBμV. (6)

Notes

(1)
The commission has proceeded in issuing a Notice of Proposed Rulemaking (ET Docket 93-62) to adopt ANSI/IEEE C95.1-1991 as guidelines for evaluating the environmental effects of radio frequency radiation.

(2)

DS&G 3/11/94 Interference Study, at 16.

(3)
DS&G 3/11/94 Interference Study, at 17.

(4)
DS&G 3/11/94 Interference Study, at 17.

(5)
DS&G 3/11/94 Interference Study, at 18.

(6)
DS&G 3/11/94 Interference Study, at 36.

Exhibit 14

Exhibit 14

EXHIBIT 14

EFL PRODUCT LINE

This summary projects the types of products most likely to be developed and commercialized during the Waiver period. The basic technology will utilize RF energy to energize a low pressure mercury discharge without electrodes, and the fundamental frequency of operation is anticipated to be within the range of 2.2 to 2.8 MHz. Other features of this product line, however, may change as market preferences dictate. The priority and timing of new products will be dependent upon market adoption as initial products are introduced during the waiver period. Eventually, all products will have an anticipated average life of 20,000 hours, if not greater.

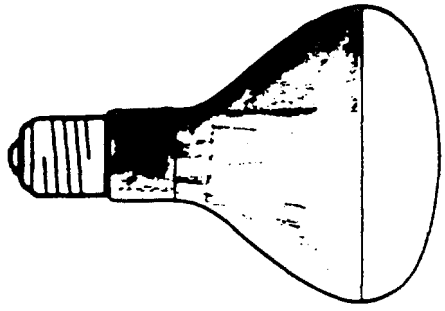
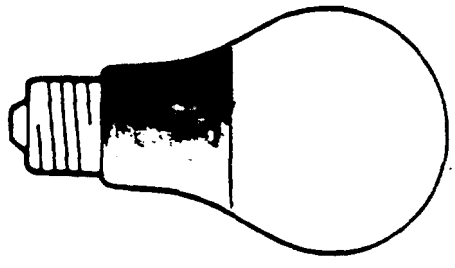
PRODUCT FAMILY	GENERAL SHAPE	PRODUCT DESCRIPTION	REPLACES
Reflector		R30/75/120V	75W Incandescent
		R30/60/120V	60W Incandescent
		R40/100/120V	100W Incandescent
		R40/150/120V	150W Incandescent
A-Line		A23/75/120V	75W Incandescent
		A23/100/120V	100W Incandescent
		A23/60/120V	60W Incandescent
		A23/150/120V-3	3 Way Incandescent
		A23/250/120V-3	3 Way Incandescent

Exhibit 1.

EXHIBIT 15

PLANS FOR 92dB TEST

The following discusses preliminary plans to test whether a 92 dB conducted limit in the frequency range from 2.2-2.8 MHz would result in practical interference potential, particularly in an aggregate situation. It must be emphasized that the final details of such a test are not easily predicted at this time, but would be finalized upon the granting of the requested waiver and would be reviewed with the responsible staff members at the FCC Columbia, Maryland facility before any test would actually proceed.

Purpose of the Test

The test will be a good indicator if proposed conducted limits for RF lighting devices of 92 dB in the range of 2.2-3.0 MHz, under consideration for CISPR 15, would in fact result in potential interference situations to services in this band in the United States, and particularly when units are aggregated in a relatively compact geographical area with relatively high population density. This test will provide much needed practical field data to both the Commission and to industry, and will facilitate the Commission's ability to determine the risk to communications services if such a limit would be adopted on a permanent basis.

Test Vehicle

The test vehicle will be a 120V medium screw base electrodeless compact fluorescent lamp (EFL) designed to represent a practical technical embodiment, having a maximum of 92 dB conducted RF voltage in the vicinity of its fundamental operating frequency, most likely 2.5-2.6 MHz. The physical configuration will most probably be that of an R30 incandescent reflector, although that would be subject to change based upon program developments between now and the time the waiver is granted. This lamp would be designed to be compatible in size with common fixtures utilizing the incandescent version in both residential and commercial applications (homes and stores).

Test Protocol

EFLs with 92 dB conducted RF line voltages would be made available to both residential consumers and stores in a geographically compact location yet to be determined. GE Lighting would work closely with selected distributors and an appropriate local utility to ensure that the lamps associated with this particular test were tracked and that test areas could be easily identified within the chosen geographical area that would facilitate subsequent technical measurements and follow up on any reported incidences of interference.

The test would ensure that certain high density areas of residences would utilize a sufficient quantity of lamps (thousands) to demonstrate a true practical aggregate situation. In addition, specific typical commercial stores would also be targeted since stores often represent one of the highest concentration densities of lighting products. It would be the intent of the test to identify at least one well controlled base case for residences and one for stores, so that actual detailed technical measurements could be made at those locations by either GE personnel or appropriate technical consultants retained by GE.

In addition to the base cases, additional EFLs would be sold locally in the same geographic location in an attempt to ensure that a realistic general ambient noise situation resulted.

In total, the number of lamps would not exceed 100,000, and, practically, might more typically number in the tens of thousands.

The specifics of this test would be reviewed with FCC staff at Columbia, Maryland prior to start of the test; however, it is anticipated that the following would be performed:

1. Submission of representative units and data to the Commission prior to the test. Supply both radiated and conducted emissions data.

2. Measure both radiated and conducted emissions in both a base control residential area and a base control store or similar commercial application. Measurements would include the profiling of emissions within a home and the store as well as detailed mapping of radiated emissions at various distances from the store and at various locations within the base case residential neighborhood.

   The Commission, with its expertise in field monitoring, is welcome to suggest techniques that from its experience are practical and credible.

3. Define certain fixed monitoring sites within the geographical area at large and periodically measure the radiated emissions at the same sites several times over the waiver period: at the beginning before the 92 dB EFLs are introduced; once approximately 6 months after the 92 dB EFLs are made available to the general test city; and once near the conclusion of the waiver period or at some other optimal point that would benefit the rulemaking activity.

Reports and Data

Ongoing data would be available to the Columbia staff and summarized in reports when it would be logical to do so. At the conclusion of the waiver period a summary report would be submitted by GE Lighting.

Instances of Interference

GE Lighting would ensure that any instances of interference are reported to the Commission under the provisions of the waiver outlined elsewhere.

If any interference would be the result of a general increase in the noise floor for specific services, it is unlikely that those services would be able to identify the specific source of the noise. As a result, GE Lighting suggests that once the specific geographical location is determined, that a mailing to all appropriate 2.2-2.8 MHz licensees in that geographical area alert them to the test, and request that they contact either GE Lighting or the FCC if they suspect this test as the source of interference to their service. Any reported incidences would result in follow up investigation by GE Lighting or a designated consultant.